

Appendix B: V0 IMS Data Dictionary Group Structure

ACCOUNT_STATUS_REQUEST group ::=

[AUTHENTICATOR]
CONTACT_ADDRESS group
DATA_CENTER_ID
[ECS_AUTHENTICATOR]
MESSAGE_ID
MONITOR group
VERSION group

ACCOUNT_STATUS_RESULT group ::=

DATA_CENTER_ID
MESSAGE_ID
MONITOR group
STATUS_CODE
[STATUS_CODE_COMMENT]
(VALID_ACCOUNT group)*
VERSION group

ACKNOWLEDGE group ::=

[MESSAGE_ID]
MONITOR group
VERSION group

BILLING_ADDRESS group ::=

[ADDRESS]
CITY
COUNTRY
[EMAIL]
[FAX]
FIRST_NAME
LAST_NAME
[MIDDLE_INITIAL]
[ORGANIZATION]
PHONE
[STATE]
[TITLE]
[ZIP]

BROWSE group ::=

FTP
INTEGRATED

BROWSE_GRANULES group ::=

DATASET_ID
GRANULE_ID

BROWSE_REQUEST group ::=

[AUTHENTICATOR]
BROWSE_GRANULES group
BROWSE_TYPE
CONTACT_ADDRESS group
DATA_CENTER_ID
[ECS_AUTHENTICATOR]
MESSAGE_ID
MONITOR group
[USER_AFFILIATION group]
VERSION group

BROWSE_URL group ::=

URL
URL_COMMENT

CONTACT_ADDRESS group ::=

ADDRESS
CITY
COUNTRY
EMAIL
[FAX]
FIRST_NAME
LAST_NAME
[MIDDLE_INITIAL]
[ORGANIZATION]
PHONE
[STATE]
[TITLE]
[ZIP]

DAAC_CONTACT_ADDRESS group ::=

[ADDRESS]
CITY
CONTACT_NAME
COUNTRY
[DAAC_ORDER_ID]
[DATASET_ID]
[EMAIL]
[FAX]
ORGANIZATION
PHONE
[STATE]
[ZIP]

DATA_SET_CONTACT group ::=

ADDRESS
DATA_CENTER_LONGNAME
[DATA_CENTER_URL]
EMAIL
[FAX]
[FIRST_NAME]
[LAST_NAME]
[MIDDLE_INITIAL]
PHONE

DATA_URL group ::=

URL
URL_COMMENT

DATASET_COVERAGE group ::=

SPATIAL
TEMPORAL

DATASET_HOME_PAGE group ::=

URL
URL_COMMENT

DATASET_ORDER_OPTIONS group ::=

[REQUIRED]
(SPECIALIZED_CRITERIA~1 group)+

DATASET_ORDER_SPEC group ::=

(SPECIALIZED_CRITERIA~2 group)*

DATASET-1 group ::=

[BROWSE_PRODUCT_DESCRIPTION]
(BROWSE_URL group)*
[CAMPAIGN]
[COMMENT]
(DATA_URL group)*
(DATASET_HOME_PAGE group)*
DATASET_ID
[DAY_NIGHT]
[EXTENDED_CRITERIA_USED]
(GRANULE group)*
[MD_ENTRY_ID]
(MISC_URL group)*
[NUMBER_OF_GRANULE_HITS]
(PACKAGE group)*
[PACKAGE_ID]
[PARAMETER-1]
[PROCESSING_LEVEL]
[RESTRICTION]
[SENSOR_NAME]
[SOURCE_NAME]
(SPECIALIZED_SEARCH_URL group)*
STATUS_CODE
(VALID_ACCOUNTS group)*

DATASET-2 group ::=

(BROWSE_URL group)*
(DATA_URL group)*
(DATASET_HOME_PAGE group)*
DATASET_ID
MD_ENTRY_ID
(MISC_URL group)*
[ORG_CENTER]
(PACKAGE group)*
[PACKAGE_ID]
[RANGE_LOC group]
(SPECIALIZED_SEARCH_URL group)*
[START_DATE]
[STOP_DATE]

DATASET~3 group ::=

[DATA_SET_CONTACT group]
DATASET_ID
DESCRIPTION
DISCIPLINE
SENSOR_NAME
SOURCE_NAME
[SPATIAL_COVERAGE group]
[START_DATE]
[STOP_DATE]
TERM
TOPIC
VARIABLE

DATASET~4 group ::=

BROWSE group
[CAMPAIGN]
DATASET_COVERAGE group
DATASET_ID~2
[DATE_AVAILABLE]
[DAY_NIGHT_FLAG]
(DEPENDENCY group)*
[EXTENDED_CRITERIA_AVAIL]
FTP_PRODUCT_AVAILABLE
GRANULE_COVERAGE group
MD_ENTRY_ID
[PARAMETER~1]
PROCESSING_LEVEL
[SENSOR]
[SOURCE]

DEPENDENCY group ::=

[PARAMETER~1]
[SENSOR]
[SOURCE]

DIRECTORY_RESULT group ::=

DATA_CENTER_ID
(DATASET~2 group | DATASET~3 group)+
MESSAGE_ID
MONITOR group
NUMBER_OF_DATASETS
(PACKAGE group)*
STATUS_CODE
[STATUS_CODE_COMMENT]
VERSION group

DIRECTORY_SEARCH group ::=

[AUTHENTICATOR]
[CAMPAIGN]
[DATA_CENTER_ID]
[DATASET_ID]
[ECS_AUTHENTICATOR]
MESSAGE_ID
MONITOR group
[PARAMETER~1]
[PROCESSING_LEVEL]
[RANGE_LOC group]
[SENSOR_NAME]
[SOURCE_NAME]
[START_DATE]
[STOP_DATE]
VERSION group

EXTENDED_SEARCH group ::=

(SPECIALIZED_CRITERIA~2 group)+

EXTENDED_SEARCH_MASTER_LIST group ::=

(SPECIALIZED_CRITERIA~1 group)*

FTP_BROWSE_RESULT group ::=

(DAAC_CONTACT_ADDRESS group)+
DATA_CENTER_ID
(DATA_URL group)*
MESSAGE_ID
MONITOR group
STATUS_CODE
[STATUS_CODE_COMMENT]
TOTAL_FILE_SIZE
VERSION group

G_RING_LOC group ::=

CENTROID_LAT
CENTROID_LON
(OUTER_RING group)+

GCMD_SEARCH group ::=

DATA_CENTER_ID
DATASET_ID
MD_ENTRY_ID
ORG_CENTER

GRANULE group ::=

[BROWSE_TYPE]
(BROWSE_URL group)*
[CAMPAIGN]
[COMMENT]
(DATA_URL group)*
[DAY_NIGHT]
[G_RING_LOC group]
GLOBAL_GRANULE | POINT_LOC group | POLYGON_LOC-2 group | RANGE_LOC group
GRANULE_ID
[INTEGRATED_BROWSE_ONLY]
[PACKAGE_ID]
[PARAMETER-1]
[PATH_ROW_LOC group]
[PROCESSING_LEVEL]
[QUADRANT_CLOUD_COVERAGE]
[SCENE_CLOUD_COVERAGE]
[SENSOR_NAME]
[SOURCE_NAME]
(SPECIALIZED_RESULTS group)*
START_DATE
STOP_DATE
[XAR_ID]

GRANULE_COVERAGE group ::=

SPATIAL
TEMPORAL

IMAGE group ::=

DATASET_ID
GRANULE_ID
IMAGE_ID
IMAGE_SIZE

INNER_RING group ::=

LATITUDE
LONGITUDE

INTEGRATED_BROWSE_RESULT group ::=

DATA_CENTER_ID
IMAGE group
[LAST_BROWSE]
MESSAGE_ID
MONITOR group
STATUS_CODE
[STATUS_CODE_COMMENT]
[VERSION group]

INVENTORY_RESULT group ::=

DATA_CENTER_ID
(DATASET~1 group)*
MESSAGE_ID
MONITOR group
{NUMBER_OF_DATASETS}
(PACKAGE group)*
STATUS_CODE
[STATUS_CODE_COMMENT]
[UNMAPPED_FIELD]
[VERSION group]

INVENTORY_SEARCH group ::=

[AUTHENTICATOR]
[BROWSE_ONLY]
[CAMPAIGN]
[CLOUD_COVERAGE]
[DATA_CENTER_ID]
[DATASET_ID]
[DAY_NIGHT]
[ECS_AUTHENTICATOR]
(EXTENDED_SEARCH group)*
[GLOBAL_GRANULES_ONLY | POINT_LOC group | POLYGON_LOC~1 group | RANGE_LOC group]
[GRANULE_ID_REQ]
GRANULE_LIMIT
MESSAGE_ID
MONITOR group
[PARAMETER~1]
[PATH_ROW_LOC group]
[PROCESSING_LEVEL]
[SENSOR_NAME]
[SOURCE_NAME]
[START_DATE]
[START_DAY_OF_YEAR]
[STOP_DATE]
[STOP_DAY_OF_YEAR]
VERSION group
[XAR_ID]

LEGEND group ::=

[COLORBAR]
DISCRETE
[LABEL]
[UNITS]

LINE_ITEM group ::=

[ADDITIONAL_INFO]
[BILLING_ID]
DATASET_ID
[DATASET_ORDER_SPEC group]
[EST_COST]
MEDIA_FORMAT~2
MEDIA_TYPE~2
[ORDER_SPEC group]
PACKAGE_ID
PROCESSING_OPTIONS
[SUBSET_SPEC group]

MEDIA group ::=

FORMAT_ID
(PRODUCT_DELIVERY group)+
TYPE_ID

MEDIA_FORMAT~1 group ::=

APPROX_COST
(DATA_URL group)*
FORMAT_ID

MEDIA_TYPE~1 group ::=

(MEDIA_FORMAT~1 group)+
NUMBER_OF_MEDIA_FORMAT
TYPE_ID

MISC_URL group ::=

URL
URL_COMMENT

MONITOR group ::=

[RX_CLIENT]
[RX_SERVER]
[SESSION_ID]
TX_CLIENT
[TX_SERVER]

ORDER_OPTIONS group ::=

[REQUIRED]
(SPECIALIZED_CRITERIA~1 group)+

ORDER_SPEC group ::=

(SPECIALIZED_CRITERIA~2 group)*

ORDER_STATUS_INFO group ::=

[COMPLETION_DATE]
INITIATOR_REQUEST_ID | REQUEST_ID-2
ORDER_STATUS_CODE
[ORDER_STATUS_COMMENT]
[PLANNED_COMPLETION_DATE]
PRICE
RECEIVE_DATE
SHIPPING_ADDRESS group
(SUB_REQUEST_STATUS_INFO group)+

OUTER_RING group ::=

(INNER_RING group)*
LATITUDE
LONGITUDE

PACKAGE group ::=

COMMENT
DATA_CENTER_ID
DATASET_ID
[DATASET_ORDER_OPTIONS group]
[INFO_PROMPT]
NUMBER_OF_GRANULES
NUMBER_OF_OPTIONS
[ORDER_OPTIONS group]
PACKAGE_ID
(PROCESSING_OPTION group)+
[SUBSET_OPTIONS group]

PARAMETER-2 group ::=

PGR_CODE
PGR_VALUE

PATH_ROW_LOC group ::=

PATH
ROW
WRS_TYPE

POINT_LOC group ::=

LATITUDE
LONGITUDE

POLYGON_LOC~1 group ::=

LATITUDE
LONGITUDE
MAP_PROJECTION_TYPE
[POLE_INCLUDED]
TANGENT_LATITUDE
TANGENT_LONGITUDE

POLYGON_LOC~2 group ::=

CENTROID_LAT
CENTROID_LON
LATITUDE
LONGITUDE
[POLE_INCLUDED]

PRICE_ESTIMATE_REQUEST group ::=

DATA_CENTER_ID
(MEDIA group)+
MESSAGE_ID
MONITOR group
VERSION group

PRICE_ESTIMATE_RESULT group ::=

DATA_CENTER_ID
ESTIMATED_PRICE
MESSAGE_ID
MONITOR group
PREDICTED_COMPLETION_DATE
[PRICE_COMMENT]
STATUS_CODE
[STATUS_CODE_COMMENT]
VERSION group

PROCESSING_OPTION group ::=

(MEDIA_TYPE~1 group)+
NUMBER_OF_MEDIA_TYPE
OPTION_ID
PACKAGE_SIZE

PRODUCT_CANCEL_REQUEST group ::=

[AUTHENTICATOR]
[ECS_AUTHENTICATOR]
INITIATOR_REQUEST_ID | REQUEST_ID~2
MESSAGE_ID
MONITOR group
SUB_REQUEST_ID
VERSION group

PRODUCT_CANCEL_RESULT group ::=

DATA_CENTER_ID
INITIATOR_REQUEST_ID | REQUEST_ID~2
MESSAGE_ID
MONITOR group
[ORDER_STATUS_CODE]
[ORDER_STATUS_COMMENT]
STATUS_CODE
[STATUS_CODE_COMMENT]
(SUB_REQUEST_INFO group)*
VERSION group

PRODUCT_DELIVERY group ::=

DATASET_ID
PACKAGE_ID
(PRODUCT_GENERATION group)*
SENSOR_TYPE

PRODUCT_GENERATION group ::=

(PARAMETER~2 group)*
PRODUCT_TYPE

PRODUCT_REQUEST group ::=

[AUTHENTICATOR]
[BILLING_ADDRESS group]
CONTACT_ADDRESS group
DATA_CENTER_ID
[ECS_AUTHENTICATOR]
[INITIAL_USER_KEY]
INITIATOR_REQUEST_ID | REQUEST_ID~1
(LINE_ITEM group | MEDIA group)+
MESSAGE_ID
MONITOR group
[SHIPPING_ADDRESS group]
USER_AFFILIATION group
VERSION group

PRODUCT_RESULT group ::=

(DAAC_CONTACT_ADDRESS group)+
DATA_CENTER_ID
(DATA_URL group)*
MESSAGE_ID
(MISC_URL group)*
MONITOR group
STATUS_CODE
[STATUS_CODE_COMMENT]
[VERSION group]

PRODUCT_STATUS_INFO group ::=

[DAAC_CONTACT_ADDRESS group]
DATA_CENTER_ID
MESSAGE_ID
MONITOR group
(ORDER_STATUS_INFO group)+
STATUS_CODE
[STATUS_CODE_COMMENT]
VERSION group

PRODUCT_STATUS_REQUEST group ::=

[AUTHENTICATOR]
[ECS_AUTHENTICATOR]
INITIATOR_REQUEST_ID | REQUEST_ID-2
MESSAGE_ID
MONITOR group
VERSION group

QUIT group ::=

[AUTHENTICATOR]
[DATA_CENTER_ID]
[ECS_AUTHENTICATOR]
MESSAGE_ID
MONITOR group
STATUS_CODE
[STATUS_CODE_COMMENT]
VERSION group

RANGE_LOC group ::=

EAST_LONGITUDE
NORTH_LATITUDE
SOUTH_LATITUDE
WEST_LONGITUDE

SHIPPING_ADDRESS group ::=

[ADDRESS]
CITY
COUNTRY
[EMAIL]
[FAX]
FIRST_NAME
LAST_NAME
[MIDDLE_INITIAL]
[ORGANIZATION]
PHONE
[STATE]
[TITLE]
[ZIP]

SPATIAL_COVERAGE group ::=

EASTBOUNDINGCOORDINATE
NORTHBOUNDINGCOORDINATE
SOUTHBOUNDINGCOORDINATE
WESTBOUNDINGCOORDINATE

SPECIALIZED_CRITERIA-1 group ::=

COMMENT
[CRITERIA_DEFAULT]
[CRITERIA_MAX]
[CRITERIA_MIN]
CRITERIA_NAME
CRITERIA_TYPE
[CRITERIA_VALUE]
[MAX_LEN]
[RANGE]
[REQUIRED]
SEARCH_CATEGORY
[SELECT_NUM]
VARIANT

SPECIALIZED_CRITERIA-2 group ::=

[CRITERIA_MAX]
[CRITERIA_MIN]
CRITERIA_NAME
[CRITERIA_TYPE]
[CRITERIA_VALUE]
[POINT_LOC group | POLYGON_LOC-1 group | RANGE_LOC group]

SPECIALIZED_RESULTS group ::=

RESULT_NAME
RESULT_VALUE

SPECIALIZED_SEARCH_URL group ::=

URL
URL_COMMENT

SUB_REQUEST_INFO group ::=

[REQUEST_STATUS_CODE]
[REQUEST_STATUS_COMMENT]
SUB_REQUEST_ID

SUB_REQUEST_STATUS_INFO group ::=

[COMPLETION_DATE]
[DAAC_CONTACT_ADDRESS group]
(DATA_URL group)*
DATASET_ID
FORMAT_ID
[NUMBER_OF_GRANULES]
[PROCESSING_DATA_CENTER]
REQUEST_STATUS_CODE
[REQUEST_STATUS_COMMENT]
SUB_REQUEST_ID
TYPE_ID

SUBSET_OPTIONS group ::=

[REQUIRED]
(SPECIALIZED_CRITERIA-1 group)+

SUBSET_SPEC group ::=

(SPECIALIZED_CRITERIA-2 group)*

USER_AFFILIATION group ::=

CATEGORY
TYPE

VALID_ACCOUNT group ::=

[ACCOUNT_COMMENT]
[ACCOUNT_NUMBER]
[BALANCE]
[ERROR]

VALIDS group ::=

DATA_CENTER_ID-2
(DATASET-4 group)+

VERSION group ::=

[IMS_STAFF]
PROTOCOL_VERSION
SENDER_VERSION

Appendix C: Status Codes

Status Code Meaning

- 1 Successful query; query results returned
- 2 No match found
- 3 Data for selected source are not archived at DAAC
- 4 Data for selected sensor are not archived at DAAC
- 5 Data set is not archived at DAAC
- 6 Data for selected parameter(s) not archived at DAAC
- 7 Data for selected source, sensor, parameter(s) and/or data set are not archived at DAAC
- 8 Pertinent inventory system unavailable; try again later
- 9 Bad message; message contains syntax error(s)
- 10 Requested function not supported by this DAAC
- 11 System error; please try again later
- 12 Search too broad; narrow spatial and/or temporal search criteria
- 13 No data for selected campaign archived at DAAC; please reconstruct Search Query
- 14 "Browse granules only" selected, but no granules having browse data match
- 15 "Global granules only" selected, but no granules having global coverage match
- 16 No data for requested processing level at this DAAC; please reconstruct Search Query
- 17 Bad message; protocol error
- 18 System busy; try again later
- 19 Data Center not responding to query, may be experiencing computer or network problems; try search again later
- 20 Data not found due to spatial and/or temporal limitation
- 21 Internal: GCMD database is down
- 22 Internal: no GCMD data
- 23 Internal: client error opening connection
- 24 Internal: client error sending message
- 25 Internal: client error receiving message
- 26 Internal: client error ingesting data
- 27 Internal: client error closing connection
- 28 Internal: client error dealing with GCMD
- 29 Network connection unexpectedly closed; try search again later
- 30 Error servicing request; contact User Services
- 99 Miscellaneous error; see comments (should always be accompanied by STATUS_CODE_COMMENT)
- 103 ASTER GDS limitation on Product Request; all products can not be accepted
- 104 ASTER GDS limitation on Product Request; number of product request is over the limitation for processing level
- 105 ASTER GDS limitation on Product Request; number of product request is over the limitation for processing level by user type
- 106 ASTER GDS limitation on Product Request; number of product request is over the limitation for user type

Status Code Meaning

- 107 ASTER GDS limitation on Product Request; number of product request is over the limitation for media type
- 109 ASTER GDS PG parameter error
- 1000 User-requested abort of search

APPENDIX D: CLIENT AND SERVER STATE TABLES

Each time a V0 client has a transaction to perform with a server, it can be viewed as becoming a finite state machine to carry out the V0 protocol. When a transaction is targeted at several servers, each server defines a separate client machine. The machine for each type of request is shown below.

Inventory Search

<i>Inventory Search State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
INVSrch_BEGIN <i>action: Begin Connection</i>	Connect in progress	INVSrch_CONNECT
	Archive down	INVSrch_TERMINATE
	Client system error	INVSrch_TERMINATE
	User requested abort	INVSrch_ABORT
INVSrch_CONNECT <i>action: Establish Connection</i>	Connection failed	INVSrch_CONNECT
	Connection opened	INVSrch_SEARCH
	Archive down	INVSrch_CLOSE
	Client system error	INVSrch_CLOSE
	User requested abort	INVSrch_ABORT
INVSrch_SEARCH <i>action: Transmit Inventory Search tree</i>	Transmitted	INVSrch_LISTEN
	Archive down	INVSrch_CLOSE
	Client system error	INVSrch_CLOSE
	User requested abort	INVSrch_ABORT
INVSrch_LISTEN <i>action: Listen for tree</i>	Got no data	INVSrch_LISTEN
	Got inventory result	INVSrch_ACK
	Got other result or ACK	INVSrch_QUIT
	Got QUIT	INVSrch_CLOSE
	Archive down	INVSrch_CLOSE
	Client system error	INVSrch_CLOSE
	User requested abort	INVSrch_ABORT
INVSrch_ACK <i>action: Transmit ACKNOWLEDGE</i>	Transmitted	INVSrch_INGEST
	Archive down	INVSrch_CLOSE
	Client system error	INVSrch_CLOSE
	User requested abort	INVSrch_ABORT
INVSrch_INGEST <i>action: Ingest inventory results</i>	Ingest successful	INVSrch_LISTEN
	Client system error	INVSrch_CLOSE
	User requested abort	INVSrch_ABORT
INVSrch_CLOSE <i>action: Close connection</i>	Connection closed	INVSrch_TERMINATE
	Client system error	INVSrch_TERMINATE
	User requested abort	INVSrch_ABORT
INVSrch_TERMINATE <i>action: Terminate transaction</i>	Terminated	stop
INVSrch_QUIT <i>action: Transmit QUIT</i>	Transmitted	INVSrch_CLOSE
	Archive down	INVSrch_CLOSE

<i>Inventory Search State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
INVSrch_ABORT <i>action: Transmit ABORT</i>	Client system error	INVSrch_CLOSE
	User requested abort	INVSrch_ABORT
	Transmitted	INVSrch_CLOSE
	Archive down	INVSrch_CLOSE
	Client system error	INVSrch_CLOSE
	User requested abort	INVSrch_TERMINATE

Directory Search

Note: the following table describes the protocol with V0 servers when the user requests directory information. The DIRECTORY_RESULT returned provides the client with the MD_ENTRY_ID used to query the GCMD for detailed dataset information. ASTER servers provide a DATASET-3 alternative containing the detailed information directly, obviating the need for the GCMD query.

<i>Directory Search State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
MD_BEGIN <i>action: Begin Connection</i>	Connect in progress	MD_CONNECT
	Archive down	MD_TERMINATE
	Client system error	MD_TERMINATE
	User requested abort	MD_ABORT
MD_CONNECT <i>action: Establish Connection</i>	Connection failed	MD_CONNECT
	Connection opened	MD_SEARCH
	Archive down	MD_CLOSE
	Client system error	MD_CLOSE
MD_SEARCH <i>action: Transmit search tree</i>	User requested abort	MD_ABORT
	Transmitted	MD_LISTEN
	Archive down	MD_CLOSE
	Client system error	MD_CLOSE
MD_LISTEN <i>action: Listen for tree</i>	User requested abort	MD_ABORT
	Got no data	MD_LISTEN
	Got directory result	MD_CLOSE
	Got other result or ACK	MD_QUIT
	Got QUIT	MD_CLOSE
	Archive down	MD_CLOSE
	Client system error	MD_CLOSE
MD_CLOSE <i>action: Close connection</i>	User requested abort	MD_ABORT
	Connection closed	MD_GCMDCOMMN
	Client system error	MD_TERMINATE
MD_GCMDCOMMN <i>action: Connect to GCMD</i>	User requested abort	MD_ABORT
	GCMD ambiguous results	MD_GCMDCOMMN
	GCMD successful results	MD_INGEST
	Terminated	MD_TERMINATE
	Archive down	MD_TERMINATE
	Client system error	MD_TERMINATE
MD_INGEST <i>action: ingest results from master directory</i>	User requested abort	MD_ABORT
	MD ingest successful	MD_TERMINATE

<i>Directory Search State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
	User requested abort	MD_ABORT
	Client system error	MD_TERMINATE
MD_TERMINATE <i>action: Terminate transaction</i>	Terminated	stop
MD_QUIT <i>action: Transmit QUIT</i>	Transmitted	MD_CLOSE
	Archive down	MD_CLOSE
	Client system error	MD_CLOSE
	User requested abort	MD_ABORT
MD_ABORT <i>action: Transmit ABORT</i>	Transmitted	MD_CLOSE
	Archive down	MD_CLOSE
	Client system error	MD_CLOSE
	User requested abort	MD_TERMINATE

FTP Browse Request

<i>FTP Request State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
FTPB_BEGIN <i>action: Begin Connection</i>	Connect in progress	FTPB_CONNECT
	Archive down	FTPB_TERMINATE
	Client system error	FTPB_TERMINATE
	User requested abort	FTPB_ABORT
FTPB_CONNECT <i>action: Establish Connection</i>	Connection failed	FTPB_CONNECT
	Connection opened	FTPB_SEARCH
	Archive down	FTPB_CLOSE
	Client system error	FTPB_CLOSE
	User requested abort	FTPB_ABORT
FTPB_SEARCH <i>action: Transmit FTP browse request tree</i>	Transmitted	FTPB_LISTEN
	Archive down	FTPB_CLOSE
	Client system error	FTPB_CLOSE
	User requested abort	FTPB_ABORT
FTPB_LISTEN <i>action: Listen for tree</i>	Got no data	FTPB_LISTEN
	Got FTP result	FTPB_INGEST
	Got other result or ACK	FTPB_QUIT
	Got QUIT	FTPB_CLOSE
	Archive down	FTPB_CLOSE
	Client system error	FTPB_CLOSE
	User requested abort	FTPB_ABORT
FTPB_INGEST <i>action: Ingest ftp browse results</i>	Ingest successful	FTPB_CLOSE
	Client system error	FTPB_CLOSE
	User requested abort	FTPB_ABORT
FTPB_CLOSE <i>action: Close connection</i>	Connection closed	FTPB_TERMINATE
	Client system error	FTPB_TERMINATE
	User requested abort	FTPB_ABORT
FTPB_TERMINATE <i>action: Terminate transaction</i>	Terminated	stop
FTPB_QUIT <i>action: Transmit QUIT</i>	Transmitted	FTPB_CLOSE
	Archive down	FTPB_CLOSE

<i>FTP Request State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
	Client system error	FTPB_CLOSE
	User requested abort	FTPB_ABORT
FTPB_ABORT <i>action: Transmit ABORT</i>	Transmitted	FTPB_CLOSE
	Archive down	FTPB_CLOSE
	Client system error	FTPB_CLOSE
	User requested abort	FTPB_TERMINATE

Integrated Browse Request

Note that this implementation does not support the Aster extension for multiple integrated browse files. If a server supporting that extension sends data to a client coded as shown below, the client will close the connection following the receipt of the first browse file and the server should presumably terminate it's discussion gracefully at that point.

<i>Integrated Browse Request State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
INTBROWSE_BEGIN <i>action: Begin Connection</i>	Connect in progress	INTBROWSE_CONNECT
	Archive down	INTBROWSE_TERMINATE
	Client system error	INTBROWSE_TERMINATE
	User requested abort	INTBROWSE_ABORT
INTBROWSE_CONNECT <i>action: Establish Connection</i>	Connection failed	INTBROWSE_CONNECT
	Connection opened	INTBROWSE_SEARCH
	Archive down	INTBROWSE_CLOSE
	Client system error	INTBROWSE_CLOSE
	User requested abort	INTBROWSE_ABORT
INTBROWSE_SEARCH <i>action: Transmit integrated browse request tree</i>	Transmitted	INTBROWSE_LISTEN
	Archive down	INTBROWSE_CLOSE
	Client system error	INTBROWSE_CLOSE
	User requested abort	INTBROWSE_ABORT
INTBROWSE_LISTEN <i>action: Listen for tree</i>	Got no data	INTBROWSE_LISTEN
	Got int browse result	INTBROWSE_READIMAGE
	Got other result or ACK	INTBROWSE_QUIT
	Got QUIT	INTBROWSE_CLOSE
	Archive down	INTBROWSE_CLOSE
	Client system error	INTBROWSE_CLOSE
	User requested abort	INTBROWSE_ABORT
INTBROWSE_READIMAGE <i>action: listen for bytes from image file</i>	Got no data	INTBROWSE_READIMAGE
	Image received	INTBROWSE_INGESTIMAGE
	Client system error	INTBROWSE_CLOSE
	User requested abort	INTBROWSE_ABORT
INTBROWSE_INGESTIMAGE <i>action: ingest bytes from image file</i>	Image completed	INTBROWSE_CLOSE
	Bytes written successfully	INTBROWSE_READIMAGE
	Client system error	INTBROWSE_CLOSE
	User requested abort	INTBROWSE_ABORT
INTBROWSE_CLOSE <i>action: Close connection</i>	Connection closed	INTBROWSE_TERMINATE
	Client system error	INTBROWSE_TERMINATE

<i>Integrated Browse Request State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
	User requested abort	INTBROWSE_ABORT
INTBROWSE_TERMINATE <i>action: Terminate transaction</i>	Terminated	stop
INTBROWSE_QUIT <i>action: Transmit QUIT</i>	Transmitted	INTBROWSE_CLOSE
	Archive down	INTBROWSE_CLOSE
	Client system error	INTBROWSE_CLOSE
	User requested abort	INTBROWSE_ABORT
INTBROWSE_ABORT <i>action: Transmit ABORT</i>	Transmitted	INTBROWSE_CLOSE
	Archive down	INTBROWSE_CLOSE
	Client system error	INTBROWSE_CLOSE
	User requested abort	INTBROWSE_TERMINATE

Product Request (Order)

<i>Product Request State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
PRES_BEGIN <i>action: Begin Connection</i>	Connect in progress	PRES_CONNECT
	Archive down	PRES_TERMINATE
	Client system error	PRES_TERMINATE
	User requested abort	PRES_ABORT
PRES_CONNECT <i>action: Establish Connection</i>	Connection failed	PRES_CONNECT
	Connection opened	PRES_SEARCH
	Archive down	PRES_CLOSE
	Client system error	PRES_CLOSE
	User requested abort	PRES_ABORT
PRES_SEARCH <i>action: Transmit product request tree</i>	Transmitted	PRES_LISTEN
	Archive down	PRES_CLOSE
	Client system error	PRES_CLOSE
	User requested abort	PRES_ABORT
PRES_LISTEN <i>action: Listen for tree</i>	Got no data	PRES_LISTEN
	Got product result	PRES_INGEST
	Got other result or ACK	PRES_QUIT
	Got QUIT	PRES_CLOSE
	Archive down	PRES_CLOSE
	Client system error	PRES_CLOSE
	User requested abort	PRES_ABORT
PRES_INGEST <i>action: Ingest order results</i>	Ingest successful	PRES_CLOSE
	Client system error	PRES_QUIT
	User requested abort	PRES_ABORT
PRES_CLOSE <i>action: Close connection</i>	Connection closed	PRES_TERMINATE
	Client system error	PRES_TERMINATE
	User requested abort	PRES_ABORT
PRES_TERMINATE <i>action: Terminate transaction</i>	Terminated	stop
PRES_QUIT <i>action: Transmit QUIT</i>	Transmitted	PRES_CLOSE
	Archive down	PRES_CLOSE

<i>Product Request State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
PRES_ABORT <i>action: Transmit ABORT</i>	Client system error	PRES_CLOSE
	User requested abort	PRES_ABORT
	Transmitted	PRES_CLOSE
	Archive down	PRES_CLOSE
	Client system error	PRES_CLOSE
	User requested abort	PRES_TERMINATE

Product Order Status

<i>Product Order Status State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
POSTATUS_BEGIN <i>action: Begin Connection</i>	Connect in progress	POSTATUS_CONNECT
	Archive down	POSTATUS_TERMINATE
	Client system error	POSTATUS_TERMINATE
	User requested abort	POSTATUS_ABORT
POSTATUS_CONNECT <i>action: Establish Connection</i>	Connection failed	POSTATUS_CONNECT
	Connection opened	POSTATUS_SEARCH
	Archive down	POSTATUS_CLOSE
	Client system error	POSTATUS_CLOSE
	User requested abort	POSTATUS_ABORT
POSTATUS_SEARCH <i>action: Transmit product order status request tree</i>	Transmitted	POSTATUS_LISTEN
	Archive down	POSTATUS_CLOSE
	Client system error	POSTATUS_CLOSE
	User requested abort	POSTATUS_ABORT
POSTATUS_LISTEN <i>action: Listen for tree</i>	Got no data	POSTATUS_LISTEN
	Got product status result	POSTATUS_INGEST
	Got other result or ACK	POSTATUS_QUIT
	Got QUIT	POSTATUS_CLOSE
	Archive down	POSTATUS_CLOSE
	Client system error	POSTATUS_CLOSE
	User requested abort	POSTATUS_ABORT
POSTATUS_INGEST <i>action: Ingest order status results</i>	Ingest successful	POSTATUS_CLOSE
	Client system error	POSTATUS_QUIT
	User requested abort	POSTATUS_ABORT
POSTATUS_CLOSE <i>action: Close connection</i>	Connection closed	POSTATUS_TERMINATE
	Client system error	POSTATUS_TERMINATE
	User requested abort	POSTATUS_ABORT
POSTATUS_TERMINATE <i>action: Terminate transaction</i>	Terminated	stop
POSTATUS_QUIT <i>action: Transmit QUIT</i>	Transmitted	POSTATUS_CLOSE
	Archive down	POSTATUS_CLOSE
	Client system error	POSTATUS_CLOSE
	User requested abort	POSTATUS_ABORT
POSTATUS_ABORT <i>action: Transmit ABORT</i>	Transmitted	POSTATUS_CLOSE
	Archive down	POSTATUS_CLOSE
	Client system error	POSTATUS_CLOSE

<i>Product Order Status State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
	User requested abort	POSTATUS_TERMINATE

Account Status

<i>Account Status State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
ACCTSTATUS_BEGIN <i>action: Begin Connection</i>	Connect in progress	ACCTSTATUS_CONNECT
	Archive down	ACCTSTATUS_TERMINATE
	Client system error	ACCTSTATUS_TERMINATE
	User requested abort	ACCTSTATUS_ABORT
ACCTSTATUS_CONNECT <i>action: Establish Connection</i>	Connection failed	ACCTSTATUS_CONNECT
	Connection opened	ACCTSTATUS_SEARCH
	Archive down	ACCTSTATUS_CLOSE
	Client system error	ACCTSTATUS_CLOSE
	User requested abort	ACCTSTATUS_ABORT
ACCTSTATUS_SEARCH <i>action: Transmit account status request tree</i>	Transmitted	ACCTSTATUS_LISTEN
	Archive down	ACCTSTATUS_CLOSE
	Client system error	ACCTSTATUS_CLOSE
	User requested abort	ACCTSTATUS_ABORT
ACCTSTATUS_LISTEN <i>action: Listen for tree</i>	Got no data	ACCTSTATUS_LISTEN
	Got account status result	ACCTSTATUS_INGEST
	Got other result or ACK	ACCTSTATUS_QUIT
	Got QUIT	ACCTSTATUS_CLOSE
	Archive down	ACCTSTATUS_CLOSE
	Client system error	ACCTSTATUS_CLOSE
	User requested abort	ACCTSTATUS_ABORT
ACCTSTATUS_INGEST <i>action: Ingest account status results</i>	Ingest successful	ACCTSTATUS_CLOSE
	Client system error	ACCTSTATUS_QUIT
	User requested abort	ACCTSTATUS_ABORT
ACCTSTATUS_CLOSE <i>action: Close connection</i>	Connection closed	ACCTSTATUS_TERMINATE
	Client system error	ACCTSTATUS_TERMINATE
	User requested abort	ACCTSTATUS_ABORT
ACCTSTATUS_TERMINATE <i>action: Terminate transaction</i>	Terminated	stop
ACCTSTATUS_QUIT <i>action: Transmit QUIT</i>	Transmitted	ACCTSTATUS_CLOSE
	Archive down	ACCTSTATUS_CLOSE
	Client system error	ACCTSTATUS_CLOSE
	User requested abort	ACCTSTATUS_ABORT
ACCTSTATUS_ABORT <i>action: Transmit ABORT</i>	Transmitted	ACCTSTATUS_CLOSE
	Archive down	ACCTSTATUS_CLOSE
	Client system error	ACCTSTATUS_CLOSE
	User requested abort	ACCTSTATUS_TERMINATE

Server State Table

Whenever a V0 server receives a request on a socket, it processes that request using a finite state machine approach. Multiple requests are interleaved by using techniques such as multitasking, but the protocol for each individual transaction is driven by the state transitions shown below. The final state "stop" can be the termination of a subtask, or the looping of that machine back to wait for a new task. Server crashes or system errors implicitly stop the subtask, but mechanisms are presumed to exist to insure the server continues to listen for new requests.

<i>Server State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
Accept <i>action: Wait for incoming messages</i>	Got Inventory Search	Query for Granules
	Got Directory Search	Query for MD Entries
	Got FTP Browse Request	Process FTP Browse Request
	Got Int. Browse Request	Process Int Browse Request
	Got Product Request	Process Product Request
	Got Account Status Req.	Process Account Status Request
	Got Product Status Req.	Process Product Status Request
	Got No Data	Accept
	Got ABORT	Stop
	Got QUIT	Stop
	Server Crash	Stop
	Server System Error	Stop
Errors	Tx QUIT [status code: 17, 18]	
Query for Granules <i>action: Query Inventory</i>	Query Success	Build First Chunk
	Errors	Tx QUIT [status code: 2-16, 19, 20]
Build First Chunk <i>action: Fetch Granule</i>	Fetch Granule Success	Tx Inventory Result Chunk
	Errors	Tx QUIT [status code: 11, 19]
Build Next Inv. Result Chunk <i>action: Check Status of Last Fetch</i>	Fetch Granule Success	Tx Inventory Result Chunk
	Fetch Granule Complete	Tx QUIT [status code: 1]
	Errors	Tx QUIT [status code: 11, 19]
Tx Inventory Result Chunk <i>action: Send Granule to Client and Fetch Next Chunk</i>	Client Down	Close
	Server Crash	Stop
	Send Granules Success	Listen Search ACK
	Errors	Tx QUIT [status code: 11, 19]
Listen Search ACK <i>action: Listen Search ACK</i>	Got Search Result ACK	Build Next Inv. Result Chunk
	Got QUIT	Close
	Got ABORT	Close
	Errors	Tx QUIT [status code: 17]
Query for MD Entries <i>action: Query Directory</i>	Query Success	Tx MD Result
	Errors	Tx QUIT [status code: 2-11, 13, 19, 20]
Tx MD Result <i>action: Send MD result to Client</i>	Send Success	Close
	Client Down	Close
	Server Crash	Stop
	Errors	Tx QUIT [status code: 11, 19]
Process FTP Browse Request <i>action: Process FTP Browse request</i>	Process success	Tx FTP Contact Info
	Errors	Tx QUIT [status code: 2, 8-11, 19]

<i>Server State and Action Taken</i>	<i>Event (returned by action)</i>	<i>New State</i>
Tx FTP Contact Info <i>action: Send FTP Contact Info to Client</i>	Send Success	Close
	Client Down	Close
	Server Crash	Stop
	Errors	Tx QUIT [status code: 11, 19]
Process Int. Browse Request <i>action: Get Image</i>	Process success	Build Integrated Browse ODL
	Errors	Tx QUIT [status code: 2, 8-11, 19]
Build Integrated Browse ODL <i>action: Build Int. Browse ODL</i>	Build success	Tx Integrated Browse ODL
	Errors	Tx QUIT [status code: 11, 19]
Tx Integrated Browse ODL <i>action: Send Int. Browse ODL to Client</i>	Send Success	Tx Integrated Browse Image
	Server Crash	Stop
	Client Down	Close
	Errors	Tx QUIT [status code: 11, 19]
Tx Integrated Browse Image <i>action: Send Int. Browse Image to Client</i>	Send Success	Tx Integrated Browse Image
	Send Complete	Close
	Server Crash	Stop
	Client Down	Close
	Got ABORT	Close
	Got QUIT	Close
	Errors	Tx QUIT [status code: 11, 19]
Process Product Request <i>action: Process Product Request</i>	Process success	Tx Product Request Contact info
	Errors	Tx QUIT [status code: 9-11, 19]
Tx Product Request Contact info <i>action: Send Product Request to Client</i>	Send Success	Close
	Client Down	Close
	Server Crash	Stop
	Errors	Tx QUIT [status code: 11, 19]
Process Account Status Request <i>action: Process Account Status Request</i>	Process success	Tx Account Status Result
	Errors	Tx QUIT [status code: 9-11, 19]
Tx Account Status Result <i>action: Send Account Status Result to Client</i>	Send Success	Close
	Client Down	Close
	Server Crash	Stop
	Errors	Tx QUIT [status code: 11, 19]
Process Product Status Request <i>action: Process Product Status Request</i>	Process success	Tx Product Status Info
	Errors	Tx QUIT [status code: 9-11, 19]
Tx Product Status Info <i>action: Send Product Status Info to Client</i>	Send Success	Close
	Client Down	Close
	Server Crash	Stop
	Errors	Tx QUIT [status code: 11, 19]
Tx QUIT [] <i>action: Send QUIT with Status Code to Client</i>	Send Success	Close
	Server Crash	Stop
	Client Down	Close
	Errors	Tx QUIT [status code: 11, 19]
Close <i>action: Close Communication</i>	Done	Stop